

In Re Patent Application of:
SALATINO ET AL.
Serial No: 09/931,587
Confirmation No. 2194
Filing Date: AUGUST 16, 2001

Listing of the Claims:

1. (Currently Amended) A method for making an integrated circuit (IC) package with an exposed portion of the IC, the method comprising:

providing a mold including first and second mold portions, the first mold portion carrying a mold protrusion defining an IC-contact surface with peripheral edges and a bleed-through retention channel positioned inwardly from the peripheral edges;

closing the first and second mold portions around the IC and injecting encapsulating material into the mold to form the IC package with the exposed portion adjacent the mold protrusion and while the bleed-through retention channel retains encapsulating material bleeding beneath the peripheral edges of the IC contact surface;

controlling pressure applied by the IC-contact surface to the IC when the first and second mold portions are closed around the IC, wherein controlling pressure comprises mounting the IC on a leadframe having resilient portions to resiliently accommodate downsetting of the IC as the IC-contact surface contacts the IC; and

releasing the IC package from the mold.

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2. (Original) A method according to Claim 1 wherein said bleed-through retention channel extends adjacent at least a portion of an entire extent of the peripheral edges of the IC-contact surface.

3. (Original) A method according to Claim 1 wherein said bleed-through retention channel extends adjacent an entire extent of the peripheral edges of the IC-contact surface.

4. (Original) A method according to Claim 1 wherein the mold protrusion has a generally rectangular shape.

5. (Canceled).

6. (Currently Amended) A method according to Claim 1 wherein controlling pressure comprises providing the mold protrusion comprising a resilient material.

7. (Canceled).

8. (Currently Amended) A method according to Claim 1 wherein the resilient portions comprise die pad support bars extending between a die pad and adjacent finger portions.

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9. (Original) A method according to Claim 8 wherein downsetting displaces the die pad below the finger portions.

10. (Original) A method according to Claim 8 further comprising shaping bond wires between the IC and the finger portions so that upon downsetting the bond wires have a desired clearance from the IC and an upper surface of the encapsulating material.

11. (Original) A method according to Claim 1 further comprising mounting the IC on a substrate prior to closing the first and second mold portions.

12. (Withdrawn) A method according to Claim 11 wherein mounting the IC comprises mounting the IC so that the substrate covers a back surface of the IC opposite the exposed portion to prevent the encapsulating material from extending onto the back face.

13. (Original) A method according to Claim 1 wherein the encapsulating material and the IC have different coefficients of thermal expansion (CTEs); wherein the encapsulating material is injected at an elevated temperature; and further comprising relieving stress caused by the different CTEs as the IC and encapsulating material cool.

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14. (Original) A method according to Claim 13 wherein relieving stress comprises using a low stress encapsulating material.

15. (Original) A method according to Claim 13 wherein relieving stress comprises providing a leadframe having a die pad with an opening therein, and mounting the IC on the die pad prior with the opening therein prior to closing the first and second mold portions around the IC.

16. (Original) A method according to Claim 15 wherein relieving stress further comprises mounting the IC on the die pad with the opening therein by adhesively securing the IC on the die pad using a low stress, low modulus adhesive.

17. (Original) A method according to Claim 1 wherein the exposed portion of the IC comprises upper surface portions with active devices formed therein.

18. (Original) A method according to Claim 17 wherein the active devices define a sensor.

19. (Original) A method according to Claim 17 wherein the active devices define an electric field fingerprint sensor.

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20. (Original) A method according to Claim 1 wherein the first and second mold portions each comprises rigid material.

21. (Original) A method according to Claim 1 further comprising periodically cleaning the mold and the mold protrusion.

22. (Previously Presented) A method for making an integrated circuit (IC) package with an exposed portion of the IC, the method comprising:

providing a mold including first and second mold portions, the first mold portion carrying a mold protrusion defining an IC-contact surface;

mounting the IC on a leadframe having resilient portions to resiliently accommodate downsetting of the IC within the mold as the IC-contact surface contacts the IC;

closing the first and second mold portions around the IC and leadframe to downset the IC under controlled pressure applied by the IC-contact surface to the IC and while the second mold portion has a surface opposite the IC that remains spaced therefrom;

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injecting encapsulating material into the mold to make the IC package with the exposed portion adjacent the mold protrusion; and
releasing the IC package from the mold.

23. (Canceled)

24. (Previously Presented) A method according to Claim 22 wherein the resilient portions comprise die pad support bars extending between a die pad and adjacent finger portions.

25. (Original) A method according to Claim 24 wherein downsetting displaces the die pad below the finger portions.

26. (Original) A method according to Claim 24 further comprising shaping bond wires between the IC and the outer finger portion so that upon downsetting the bond wires have a desired clearance from the IC and an upper surface of the encapsulating material.

27. (Original) A method according to Claim 22 wherein the encapsulating material and the IC have different coefficients of thermal expansion (CTEs); wherein the encapsulating material is injected at an elevated temperature;

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and further comprising relieving stress caused by the different CTEs as the IC and encapsulating material cool.

28. (Original) A method according to Claim 27 wherein relieving stress comprises using a low stress encapsulating material.

29. (Previously Presented) A method according to Claim 27 wherein relieving stress comprises providing a leadframe having a die pad with an opening therein, and mounting the IC on the die pad with the opening therein prior to closing the first and second mold portions around the IC.

30. (Original) A method according to Claim 29 wherein relieving stress further comprises mounting the IC on the die pad with the opening therein by adhesively securing the IC on the die pad using a low stress, low modulus adhesive.

31. (Original) A method according to Claim 22 wherein the exposed portion of the IC comprises upper surface portions with active devices formed therein.

32. (Original) A method according to Claim 31 wherein the active devices define a sensor.

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33. (Original) A method according to Claim 22 wherein the mold protrusion comprises a resilient material.

Claims 34-62. (Canceled).